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**Dispenser for paste-like products.**

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## Description

The present invention relates to a dispenser for paste-like products, comprising a container for containing a product supply, said container having its bottom side closed by a follower piston and being provided with a head piece including a manually operable metering device comprising a dispenser piston slidably displaceable in a pump chamber by means of an actuator cap, said pump chamber being adapted to be selectively communicated with said container and with a dispensing channel, respectively, in response to displacement of said dispenser piston. Such a dispenser is known from US-A 4 515 298

Manually operable piston dispensers for creamy, flowable materials are used as portable supply containers for numerous applications, e.g. for dispensing medical or cosmetic products, for the supply of paste-like alimentary products and for metering polishes and cleaning products for instance in the domestic field.

There are numerous types of such dispenser systems in use, depending on the respective applications.

It has been found rather difficult, however, to devise a structurally simple and inexpensive handling and actuating system for dispensers of this type, which should be readily and reliably operable over extended periods of time and ensure clean and metered dispensing of the respective paste-like product.

Proposed in DE-OS 36 01 311 (published 27.7.87) is a dispenser of the type defined above which functions on the pressure piston principle with the employ of a follower piston for ensuring the feed of the paste-like product within the dispenser.

In this case, the product is supplied from a large-volume supply container to a smaller pump chamber with the aid of atmospheric pressure acting on the follower piston, when the respective dispenser piston moves upwards in a suction stroke, as a result of which the pressure in the pump chamber is lower than that in the large-volume supply container. Depression of the dispensing piston causes a non-return valve connecting the pump chamber to the large-volume supply container to be closed, and a second non-return valve in the dispensing channel of the dispenser to be opened, so that the paste-like product is dispensed from the pump chamber in response to the length of the stroke of the dispenser piston.

This basic construction of a dispenser has been found useful for dispensing paste-like products. The proper function of a dispenser of this type depends to a substantial degree on the reliable operation of the first and second non-return valves. With a view to further reducing the production costs for dispensers of this type, it is desirable to further lower the requirements and demands regarding the construction and design of the control valves for admitting the paste-like products from the supply container to the pump chamber, and from the pump chamber to the dispensing channel.

In this context, particular attention has to be devoted to the manufacturing costs required for making the dies employed for injection-molding the components of the dispenser of a plastics material as a preferred production method.

It is therefore an object of the present invention to improve a dispenser of the type defined above in such a manner that its construction is greatly simplified, particularly as regards its control elements controlling the dispensing of the paste-like product, so as to provide a compact and reliably operable construction capable of being assembled in a simple manner and of functioning reliably and with a high metering accuracy.

In accordance with the characterizing clause of claim 1 the invention attains this object by the provision that the actuating cap of the dispenser is provided with an axial tube portion in which a guide tube of the dispenser piston is received in axially displaceable coupling engagement. Additionally provided is a sealing cap defining a communication cavity communicating on the one hand with a passage opening of the container and adapted on the other hand to be communicated with the pump chamber through a controllable supply opening, the sealing cap forming a sealed passage for the tube portion of the actuating cap, the supply opening between the pump chamber and the communication cavity being adapted to be directly controlled by the tube portion of the actuator cap.

In this manner, particularly the control of the supply of the paste-like product from the supply container to the pump chamber is considerably simplified by eliminating the necessity of the previously required differential-pressure operated valve flap for metering a determined amount of the product to be fed from the supply container to the pump chamber. This results in a considerable simplification of the dispensing mechanism as a whole, and in a reduction of the production costs of the dispenser, while providing a highly compact and reliable operating mechanism for the dispenser. According to the subject matter of the invention, the supply of the paste-like product from the supply container to the pump chamber is no longer controlled, as it was formerly, by the pressure difference between the pump chamber and the supply container, but in a rather more advantageous manner by closing the respective communication passage directly on depression of the actuator cap and the resultant displacement of the dispenser piston for the dispensing stroke. In a corresponding manner, the opening of this passage during the suction stroke of the dispenser piston is directly controlled by the displacement of the actuator cap and the dispenser piston relative to one another. Further advantageous aspects of the invention are detailed in the subclaims.

An embodiment of the invention shall now be described in detail by way of example with reference to the accompanying drawings, wherein:

fig. 1 shows a diagrammatical view of a dispenser in a longitudinal section, and

fig. 2 shows an enlarged longitudinal sectional view of a head piece of the dispenser of fig. 1.

Diagrammatically shown in fig. 1 is a longitudinal sectional view of a dispenser 1 for paste-like products, for instance toothpaste. The main components of dispenser 1 include a cylindrical container 2, a head piece 3 connected to the top of container 2, a closure cap 4 covering the top of container 2 including head piece 3, and a follower piston 5 slidably supported in container 2. Head piece 3 is defined by a cylindrical outer guide section 6 supporting an actuator cap 7. All of the components of dispenser 1 are preferably made by injection-molding a suitable plastics material, particularly polyethylene or polypropylene, so that dispenser 1 is of lightweight construction while avoiding any reaction between the paste-like product contained in container 2 and the material of dispenser 1. Follower piston 5 acts to feed the paste-like product from the interior of supply container 2 to a metering device 8 forming the essential portion of head piece 3. In this manner, the product in container 2 is always subjected to the pressure of the ambient atmosphere acting on the bottom face of follower piston 5. As a result, the dispensing of the product from dispenser 1 causes follower piston 5 to be automatically moved upwards in the feed direction, so that container 2 is incrementally emptied on actuation of metering device 8 of the dispenser. This ensures a simple feeding of the paste-like product within dispenser 1 to metering device 8 in head piece 3. At the same time this arrangement is effective to avoid the occurrence of a vacuum within container 2 on dispensing the paste-like product from dispenser 1, as well as the entry of ambient air into the interior of the container.

Outer guide section 6 of head piece 3 is slightly offset radially inwards with respect to the cylindrical wall of container 2, an exterior threaded collar forming a seat for closure cap 4 to be positioned on container 2 in axial alignment therewith, so that dispenser 1 as a whole has a smooth and uniform outer shape.

The construction of head piece 3, and in particular of metering device 8 is more clearly evident from fig. 2, showing an enlarged illustration of the head piece 3 of fig. 1 with closure cap 4 positioned thereon.

As shown in this figure, outer guide section 6 including threaded collar 9 for threaded engagement of closure cap 4 on its outer periphery is integrally connected to an end wall 10 forming the upper boundary of container 2. Proceeding radially inwards, end wall 10 is provided with coaxial annular projections 11, 12 defining one or several passage openings 13 to the interior of container 2 therebetween. Annular projection 11 is of a smaller axial length than annular projection 12 and has its outer periphery formed as a sealing seat for a bell-shaped sealing cap 14 to be described in detail as the description proceeds. Inner annular projection 12 is formed as an annular wall of a pump chamber 15 as an important element of metering device 8. A bottom portion of pump chamber 15 is formed integrally with end wall 10 in the shape of a frustoconical elevation projecting upwards into pump chamber 15 so as to ensure the substantially complete dispensing of a product supply introduced into the pump cham-

ber. Also for ensuring substantially complete dispensing of the paste-like product from dispenser 1, the bottom portion of pump chamber 15 is formed with a centrally located pin 16 extending axially upwards.

Fig. 2 shows follower piston 5 in its upper end position in which it abuts end wall 10, and in which the paste-like product has been completely discharged from container 2. Corresponding to the shape of the bottom portion of pump chamber 15 which at this location forms the upper closure of the interior of container 2, follower piston 5 is integrally formed with a central frustoconical projection adapted in the upper end position of follower piston 5 to conform to the concave configuration of the lower surface of the bottom portion of pump chamber 15 so as to ensure substantially complete emptying of container 2.

As already stated above, outer guide section 6 also serves as a sliding seat for the axial displacement of actuator cap 7 retained thereon by the engagement of a projection, so that actuator cap 7 cannot be removed from guide section 6 while being slidably displaceable thereon in an axially downward direction.

Actuator cap 7 is of a cup-shaped configuration and integrally connected to an inner tube portion 17 coaxial with actuator cap 7 at a central location thereof. The bottom wall of actuator cap 7 defines the axially upper end of the assembled dispenser and is formed with slip-preventing grooves 18. Tube portion 17 is angled outwards adjacent the bottom wall of actuator cap 7.

With its interior diameter tube portion 17 defines an outlet channel of dispenser 1, i.e. the paste-like product is dispensed directly through actuator cap 7 on depression thereof.

For avoiding entry of ambient atmosphere into the interior of tube portion 17, the outlet opening of dispensing channel 19 may be closed by a removable closure member 20 formed with a grip element 21 for facilitating its insertion into dispensing channel 19 and its removal therefrom for use of dispenser 1.

The lower end portion of central tube portion 17 of actuator cap 7 facing towards container 2 acts as a mounting portion for a dispenser piston 22 of metering device 8. To this purpose, a guide tube 23 of dispenser piston 22 is slidably received in tube portion 17. Dispenser piston 22 is formed as a hollow conical member having a lower peripheral sealing edge formed by the cuneiform convergent cross-section of dispenser piston 22 and disposed in sealingly sliding engagement with the interior surface of the annular wall of pump chamber 15, i. e. with the inner wall surface of annular projection 12.

Guide tube 23 is integrally connected to dispenser piston 22, with the inner tubular cross-section of guide tube 23 extending through dispenser piston 22 itself, so that the latter has an opening 24 through which pump chamber 15 communicates with guide tube 23 from below dispenser piston 22.

For retaining dispenser piston 22 in tube portion 17 by means of its integral guide tube 23, the latter has its outer periphery formed with a circumferential annular projection 25 defined in the axial direc-



tion by suitable shoulders 26. This annular projection acts as an engagement element positively retained in a first cylindrical recess 27 in the interior wall surface of tube portion 17. Upper and lower annular shoulders defining the first cylindrical recess are inclined in a manner corresponding to the inclination of shoulders 26 of annular projection 25 on guide tube 23.

The axial length of first cylindrical recess of tube portion 17 is greater than that of annular projection 25 on guide tube 23, thus permitting a sliding displacement to occur between tube portion 17 and guide tube 23.

The end of guide tube 23 facing towards the downstream end of dispensing channel 19 is formed with an inclined end face. The thus formed pointed end portion of guide tube 23 is hingedly connected to a valve flap 28 formed integral therewith.

Dispenser piston 22, guide tube 23 and valve flap 28 are preferably made as a unitary injection-molded plastics structure.

Valve flap 28 is hingedly connected to guide tube 23 by a connection strip 29 and formed in the manner of a spherical wall section. In association with valve flap 28, a second cylindrical recess 30 formed in tube portion 17 above first cylindrical recess 27 provides an inclined annular seat surface 31 for supporting a complementary sealing edge of valve flap 28 thereon.

Guide tube 23 is received in tube portion 17 in such a manner that the distance between annular projection 25 of guide tube 23 and the rear face of dispenser piston 22 is greater than the length of the respective end portion of tube portion 17 surrounding guide tube 23. Due to the provision of this distance the lower end edge 32 of tube portion 17 is disposed opposite the rear face of dispenser piston 22.

In this case, the above defined distance at the same time establishes a limit for the maximum opening width of a slot 33 formed in the wall of guide tube 23 and leading to a lateral opening of metering device 8. As will be explained as the description proceeds, slot 33 thus forms an entry opening for the paste-like product from container 2 into pump chamber 15 via opening 24 of dispenser piston 22.

The active parts of metering device 8, i. e. pump chamber 15 with dispenser piston 22 and its mounting in tube portion 17 of actuator cap 7, and including passage opening 13 in end wall 10 of container 2, are sealingly enveloped by bell-shaped sealing cap 14, to which purpose the latter is sealingly mounted on end wall 10 so as to surround annular projection 11, while its upper portion is formed with a passage 34 for tube portion 17 to extend therethrough in a sealing slide fit. To this purpose sealing cap 14 is provided with a pair of sealing lips adjacent passage 34. Further sealing lips are integrally formed adjacent end wall 10, and annular projection 11 is provided with an annular sealing collar (not shown in the drawings) sealingly engaging the interior wall surface of sealing cap 14.

For achieving a good sealing effect, sealing cap 14 should be made of a soft elastic plastics material or of a durable rubber-elastic material.

For ensuring sufficient form stability, an upper portion of sealing cap 14 above pump chamber 15 is formed with stiffener ribs 35 supported on the upper rim of annular projection 12, i.e. of the annular wall of pump chamber 15. This results in a sufficient stiffness of sealing cap 14 in the axial direction, which is important in view of the fact that the substantially horizontal top surface of sealing cap 14 has to support a return spring 36 effective to bias actuator cap 7 upwards to its rest position defined by engagement with outer guide section 6.

Bell-shaped sealing cap 14 thus defines a sealed annular communication space 37 by way of which the interior of container 2 communicates with pump chamber 15, and thus with dispensing channel 19, via the at least one passage opening 13, for instance one or more annular slot sections formed in end wall 10, slot 33 and opening 24 of dispenser piston 22.

The above described dispenser 1 operates as follows:

Be it assumed that follower piston 5 is in its lowermost position, that container 2 is filled with a paste-like product to be dispensed, and that communication space 36 including pump chamber 15 are likewise filled with the paste-like product.

As actuator cap 7 is now depressed against the biasing force of return spring 36 to be displaced axially downwards on outer guide section 6, tube portion 17 of actuator cap 7 is moved downwards by a distance corresponding to the axial length of first cylindrical recess 27, while dispenser piston 22 including guide tube 23 is kept stationary by the action of frictional forces and by the resistance offered by the mass of the paste-like product contained in pump chamber 15. Simultaneously with the downward movement of tube portion 17, annular seat surface 31 moves away from the associated sealing edge of valve flap 28, which is then only retained on guide tube 23 by its connection strip. The displacement of tube portion 17 relative to guide tube 23 at the same time results in the obturation of slot 33 in the manner of a slide valve control, whereupon end rim 32 comes into contact with the rear face of dispenser piston 22 to act as an actuator element for dispenser piston 22. The stroke of this displacement corresponds to the difference between the axial lengths of annular projection 25 and first cylindrical recess 27, so that substantially at the same time the upper end of first cylindrical recess 27 comes into contact with upper shoulder 26 of annular projection 25. Further depression of actuator cap 7 subsequently results in synchronous downwards displacement of dispenser piston 15 to thereby reduce the volume of pump chamber 15.

It need not be mentioned, of course, that closure member 20 has been removed from the outlet opening of dispensing channel 19 prior to actuation of dispenser 1.

Due to the obturation of slot 33, and assisted by the conical interior contour of dispenser piston 22 corresponding to the configuration of the bottom portion of pump chamber 15 including central pin 16, the paste-like product contained in pump chamber 15 is now displaced inwards from the peripheral zones of pump chamber 15 and upwards through opening

24 of dispenser piston 22 into guide tube 23, whereby valve flap 28 is swivelled to an open position, permitting a metered amount of the paste-like product to enter dispensing channel 19 and to be dispensed therefrom. The complementary configuration of the hollow-cone dispenser piston and of the bottom wall portion of pump chamber 15 including central pin 16 is conducive to a complete emptying of pump chamber 15 during a full pressure stroke, and to the establishment within pump chamber 15 of a determined direction of flow, whereby portions of the paste-like product contained in the lower peripheral zones of the pump chamber are reliably expelled at the end of the dispensing stroke. The central pin 16 is also effective to avoid an accumulation of the paste-like product in the central area of the bottom of the pump chamber, and to assist the entry of the paste-like product into guide tube 23, i.e., onto the end of dispensing channel 19.

As the downwards displacement of actuator cap 7 is terminated by relieving the exterior actuating force acting thereon, return spring 36 acts to return actuator cap 7 upwards to its initial position, while dispenser piston 22 is initially kept stationary by the friction acting between the sealing edge of dispenser piston 22 and the interior wall surface of pump chamber 15, i.e. annular projection 12, so that at the beginning of the return movement of actuator cap 7, tube portion 17 moves upwards relative to guide tube 23 and dispenser piston 22 by a distance corresponding to the difference in axial length between annular projection 25 and first cylindrical recess 27, until the lower shoulder of the annular projection comes into contact with the lower shoulder of first cylindrical recess 27, whereupon the dispenser piston follows the upwards movement of actuator cap 7. In this manner the obturation of slot 33 by tube portion 17 is cancelled before dispenser piston 22 starts moving upwards. At the same time, annular seat surface 31 of second cylindrical recess 30 in tube portion 17 comes into contact with valve flap 28, whereby the latter is returned to its closed position in sealing engagement of its peripheral rim with annular seat surface 31 of second cylindrical recess 30. This actuation of the valve flap is assisted by the paste-like product remaining within dispensing channel 19 above valve flap 28 at the end of the dispensing operation, as the vacuum created within pump chamber 15 by the return stroke of the actuator cap tends to suck the remaining product back into the pump chamber.

The vacuum created in pump chamber 15 by the return movement of dispenser piston 22 as a result of the return movement of actuator cap 7 by the action of return spring 36 in combination with the described simultaneous opening of slot 33 results in that, assisted by the atmospheric pressure acting on follower piston 5, a further charge of the paste-like product is sucked into pump chamber 15 via opening 13, communication space 34, slot 33 and opening 24 of dispenser piston 22, so that pump chamber 15 is again filled with the paste-like product preparatory to the next dispensing stroke.

The control of slot 33 is thus established in a particularly favourable manner by the sliding fit of

guide tube 23 in tube portion 17 to function on the principle of a slide valve control, to thereby achieve a greatly simplified construction and reliable operation of the dispenser itself and its valve control means.

The described dispenser is characterized by the lateral entry of the paste-like product from container 2 into pump chamber 15, from which metered amounts of the paste-like product are dispensed through the dispenser piston 22 and centrally through the actuator cap.

All of the components of dispenser 1, with the exception of return spring 36 are made as injection-molded plastic parts.

The described embodiment of the dispenser may of course be modified in various manners without sacrificing the simple basic construction thereof, particularly as regards its valve control. It is thus possible to employ separate sealing rings adjacent passage 34, or to insert a separate non-return valve in place of valve flap 28. It is also envisaged, for instance, to mount pump chamber 15 on end wall 10 in the form of a separate sleeve member.

The dispenser is characterized by an uncomplicated construction, and in particular, by a simplification of the metering device with regard to the required valve control between the supply container and the pump chamber, and between the pump chamber and the dispensing outlet, and offers a high degree of reliability in the accurately metered dispensing of paste-like products of any type, such as pharmaceutical creams and ointments, paste-like alimentary products, e.g. mustard, ketchup and the like, or cleansing and other treatment compositions for cosmetic uses as well as for use in the domestic and automotive maintenance fields.

#### Claims

1. A dispenser for paste-like products, comprising a container (2) for containing a product supply, said container (2) having its bottom side closed by a follower piston (5) and being provided with a head piece (3) including a manually operable metering device (8) comprising a dispenser piston slidably displaceable in a pump chamber (15) by means of an actuator cap (7), said pump chamber (15) being adapted to be selectively communicated with said container (2) and a dispensing channel (19), respectively, in response to displacement of said dispenser piston (22), characterized in that said actuator cap (7) is provided with an axial tube portion (17) in which a guide tube (23) of said dispenser piston (22) is received in axially displaceable coupling engagement, and a sealing cap (14) defines a communication cavity (37) communicating with a passage opening (13) of said container (2) and adapted to be selectively communicated with said pump chamber (15) through a controllable supply opening (33), said sealing cap (14) forming a product-tight passage (34) for said tube portion (17) of said actuator cap (7), said supply opening (33) between said pump chamber (15) and said communication cavity (37) being adapted to be directly controlled by said tube portion (17) of said actuator cap (7).



2. A dispenser according to claim 1, characterized in that said dispenser piston (22) is formed as a cup-shaped annular body having a central opening (24) in its bottom portion, and is of integral construction with said guide tube (23).

3. A dispenser according to claim 1, characterized in that said guide tube (23) is provided with an annular projection (25) received in a first cylindrical cavity (27) within said tube portion (17) of said actuator cap (7), the axial length of said cylindrical cavity (27) being greater, preferably twice as great as the axial length of said annular projection (25) of said guide tube (23).

4. A dispenser according to claim 1, characterized in that the upper end of said guide tube (23) facing away from said dispenser piston (22) is integrally provided with a valve flap (28) hingedly connected to the preferably bevelled edge of said guide tube (23) and adapted in a closed position to be supportingly engaged with an annular seat surface (31) of a second cylindrical cavity (30) of the tube portion (17) of said actuator cap (7).

5. A dispenser according to claim 1, characterized in that said supply opening is formed as a slot (33) in the wall of said guide tube (23) at the end portion thereof facing towards the dispenser piston, said slot being adapted to be opened and closed, respectively, by an end portion of the tube portion (17) of said actuator cap (7) facing towards said piston.

6. A dispenser according to claim 1, characterized in that said passage (34) of said sealing cap (14) is formed with a twin lip seal acting as a sliding seat for said tube portion (17) of said actuator cap (7).

7. A dispenser according to claim 1, characterized in that said tube portion (17) of said actuator cap (7) cooperates with said central opening (24) of said dispenser piston (22) and said guide tube (23) to form said dispensing channel (19), said dispensing channel being angled outwards in a bottom portion of said actuator cap (7).

8. A dispenser according to claim 7, characterized in that a separate closure member (20) integrally provided with a grip element (21) is inserted into an outlet opening of said dispensing channel (19).

9. A dispenser according to claim 1, characterized in that a top surface of said sealing cap (14) forms a seat for a return spring (36) having its opposite end engaged with a bottom portion of said actuator cap (7) and coaxially surrounding said tube portion (17).

10. A dispenser according to claim 1, characterized in that the upper end portion of said container (2) is substantially closed by an upper end wall (10) providing at least one passage opening (13) and integrally formed with an outer guide section (6) acting as a sliding seat for said actuator cap (7), and in sequence radially inwards, with a first annular projection (11) and a second annular projection (12).

11. A dispenser according to claim 10, characterized in that said first and second annular projections (11, 12) define annular openings acting as said passage openings (13) in said end wall (10) of said container.

12. A dispenser according to claim 10, characterized in that the radially inner second annular projection (12) forms said pump chamber (15).

13. A dispenser according to claim 10, characterized in that said first annular projection (11) forms a mounting seat for said sealing cap (14).

14. A dispenser according to claim 1, characterized in that said tube portion (17), said dispenser piston (22), said pump chamber (15) and said sealing cap (14) are disposed in coaxial symmetric alignment with respect to the longitudinal center axis of the dispenser (1).

15. A dispenser according to claim 14, characterized in that a contour of the bottom of said pump chamber (15) conforms to the cup-shaped opposite contour of said dispenser piston (22) and is provided with a central pin (16) projecting therefrom in the direction of said dispenser piston.

16. A dispenser according to claim 15, characterized in that said dispenser piston (22) as well as the bottom of said pump chamber (15) are formed with corresponding inclined boundary surfaces for reducing a flow resistance.

17. A dispenser according to claim 1, characterized in that said sealing cap (14) is provided with stiffener ribs (35) for the support of said passage (34) at an upper rim of said second annular projection (12) forming said pump chamber (15).

18. A dispenser according to claim 1, characterized in that said container (2) is formed as a cylindrical body adapted to have a closure cap (4) covering said actuator cap (7) screwed thereonto.

19. A dispenser according to claim 1, characterized in that said actuator cap (7) is displaceably and lockably guided on an inner surface of said guide section (6), and said closure cap (4) is retained on the outer surface of said guide section (6).

20. A dispenser according to claim 1, characterized in that said follower piston has a central projection adapted in an upper end position of said follower piston to be received in a complementary recess formed by the bottom of said pump chamber (15).

## Patentansprüche

1. Spender für pastöse Produkte mit einem Behälter (2) zur Aufnahme eines Produktvorrates, wobei der Behälter (2) an seiner Bodenseite durch einen Nachlaufkolben (5) abgeschlossen ist und mit einem Kopfstück (3), das eine manuell betätigbare Dosiervorrichtung (8) aufweist, versehen ist, mit einem Spenderkolben, der gleitbar in einer Pumpkammer (15) durch eine Betätigungskappe (7) verlagerbar ist, wobei die Pumpkammer (15) vorgesehen ist, um wahlweise mit dem Behälter (2) und einem Ausgabekanal (19) jeweils in Abhängigkeit von der Verlagerung des Spenderkolbens (22) verbunden zu werden, dadurch gekennzeichnet, daß die Betätigungskappe (7) mit einem axialen Rohrabchnitt (17) versehen ist, in dem ein Führungsrohr (23) des Spenderkolbens (22) in axial gleitbarem Kuppelungseingriff aufgenommen ist und eine Dichtungskappe (14) einen Kommunikationsraum (37) begrenzt, der kommunizierend mit einer Durchgangsöffnung (13) des Behälters (2) verbunden ist und

vorgesehen ist, um wahlweise mit der Pumpkammer (15) durch eine steuerbare Zuführungsöffnung (33) verbunden zu werden, wobei die Dichtungskappe (14) eine produktichte Durchführung (34) für den Rohrabschnitt (17) der Betätigungskappe (7) bildet, und die Zuführungsöffnung (33) zwischen der Pumpkammer (15) und dem Kommunikationsraum (37) vorgesehen ist, um direkt durch den Rohrabschnitt (17) der Betätigungskappe (7) gesteuert zu werden.

2. Spender nach Anspruch 1, dadurch gekennzeichnet, daß der Spenderkolben (22) als ein tassenförmiger Ringkörper mit einer Mittelöffnung (24) in seinem Bodenabschnitt gestaltet und von integral einstückigem Aufbau mit dem Führungsrohr (23) ist.

3. Spender nach Anspruch 1, dadurch gekennzeichnet, daß das Führungsrohr (23) mit einem Ringvorsprung (25), aufgenommen in einer ersten Zylinderausnehmung (27) innerhalb des Rohrabschnittes (17) der Betätigungskappe (7), versehen ist, wobei die axiale Länge der Zylinderausnehmung (27) größer, vorzugsweise doppelt so groß ist wie die axiale Länge des Ringvorsprungs (25) des Führungsrohres (23).

4. Spender nach Anspruch 1, dadurch gekennzeichnet, daß das obere Ende des Führungsrohres (23), das von dem Spenderkolben (22) weggewandt ist, integral einstückig mit einer Ventilklappe (28) versehen ist, die scharnierartig mit der vorzugsweise abgeschrägten Kante des Führungsrohres (23) verbunden ist und vorgesehen ist, in einer Schließstellung in abstützendem Eingriff mit einer ringförmigen Sitzfläche (31) einer zweiten Zylinderausnehmung (30) des Rohrabschnittes (17) der Betätigungskappe (7) zu sein.

5. Spender nach Anspruch 1, dadurch gekennzeichnet, daß die Zuführungsöffnung als ein Schlitz (33) in der Wand des Führungsrohres (23) an dem Endabschnitt derselben, der dem Spenderkolben zugewandt ist, ausgebildet ist, wobei der Schlitz vorgesehen ist, um jeweils durch einen Endabschnitt des Rohrabschnittes (17) der Betätigungskappe (7), der zu dem Kolben hinweist, geöffnet und geschlossen zu werden.

6. Spender nach Anspruch 1, dadurch gekennzeichnet, daß die Durchführung (34) der Dichtungskappe (14) mit einer Doppel-Lippendichtung, die als ein Gleitsitz für den Rohrabschnitt (17) der Betätigungskappe (7) wirksam ist, versehen ist.

7. Spender nach Anspruch 1, dadurch gekennzeichnet, daß der Rohrabschnitt (17) der Betätigungskappe (7) mit der Mittelöffnung (24) des Spenderkolbens (22) und dem Führungsrohr (23) zusammenwirkt, um den Ausgabekanal (19) zu bilden, wobei der Ausgabekanal in einem Bodenbereich der Betätigungskappe (7) nach außen abgewinkelt ist.

8. Spender nach Anspruch 7, dadurch gekennzeichnet, daß ein separates Verschlußstück (20), das integral einstückig mit einem Griffelement (21) versehen ist, in eine Auslaßöffnung des Ausgabekanales (19) eingesetzt ist.

9. Spender nach Anspruch 1, dadurch gekennzeichnet, daß eine Oberseite der Dichtungskappe

(14) einen Sitz für eine Rückstellfeder (36) bildet, deren entgegengesetztes Ende mit einem Bodenabschnitt der Betätigungskappe (7) in Eingriff ist und koaxial den Rohrabschnitt (17) umgibt.

10. Spender nach Anspruch 1, dadurch gekennzeichnet, daß der obere Endabschnitt des Behälters (2) im wesentlichen durch eine obere Endwand (10) geschlossen ist, die zumindest eine Durchgangsöffnung (13) bildet und integral einstückig mit einem äußeren Führungsabschnitt (6), der als ein Gleitsitz für die Betätigungskappe (7) wirksam ist, versehen ist und in radialer Abfolge einwärts mit einem ersten Ringvorsprung (11) und einem zweiten Ringvorsprung (12) versehen ist.

11. Spender nach Anspruch 10, dadurch gekennzeichnet, daß der erste und zweite Ringvorsprung (11, 12) Ringöffnungen begrenzen, die als die Durchgangsöffnungen (13) in der Endwand (10) des Behälters wirksam sind.

12. Spender nach Anspruch 10, dadurch gekennzeichnet, daß der radial innenliegende zweite Ringvorsprung (12) die Pumpkammer (15) begrenzt.

13. Spender nach Anspruch 10, dadurch gekennzeichnet, daß der erste Ringvorsprung (11) einen Halterungssitz für die Dichtungskappe (14) bildet.

14. Spender nach Anspruch 1, dadurch gekennzeichnet, daß der Rohrabschnitt (17), der Spenderkolben (22), die Pumpkammer (15) und die Dichtungskappe (14) in koaxial symmetrischer Ausrichtung in bezug auf die Längsmittelachse des Spenders (1) angeordnet sind.

15. Spender nach Anspruch 14, dadurch gekennzeichnet, daß eine Kontur des Bodens der Pumpkammer (15) mit der tassenförmigen Gegenkontur des Spenderkolbens (22) übereinstimmt und mit einem zentralen Dorn (16) versehen ist, der von diesem in Richtung des Spenderkolbens vorsteht.

16. Spender nach Anspruch 15, dadurch gekennzeichnet, daß der Spenderkolben (22) ebenso wie der Boden der Pumpkammer (15) mit entsprechenden geneigten Grenzflächen zur Verminderung eines Strömungswiderstandes versehen sind.

17. Spender nach Anspruch 1, dadurch gekennzeichnet, daß die Dichtungskappe (14) mit Versteifungsrippen (35) zur Lagerung der Durchführung (34) an einem oberen Rand des zweiten Ringvorsprungs (12), der die Pumpkammer (15) begrenzt, versehen ist.

18. Spender nach Anspruch 1, dadurch gekennzeichnet, daß der Behälter (2) als ein Zylinderkörper ausgebildet ist, vorgesehen eine Verschlußkappe (4) zu haben, die die Betätigungskappe (7) abdeckt und auf diesen aufgeschraubt ist.

19. Spender nach Anspruch 1, dadurch gekennzeichnet, daß die Betätigungskappe (7) an einer Innenfläche des Führungsabschnittes (6) verlagerbar und verrastbar geführt ist und die Verschlußkappe (4) an der Außenfläche des Führungsabschnittes (6) gehalten ist.

20. Spender nach Anspruch 1, dadurch gekennzeichnet, daß der Nachlaufkolben einen mittleren Vorsprung besitzt, vorgesehen, um in einer oberen Endlage des Nachlaufkolbens in einer komplementären Ausnehmung, gebildet durch den Boden der Pumpkammer (15), aufgenommen zu werden.



## Revendications

1. Distributeur pour produits pâteux, comprenant un conteneur (2) pour contenir une alimentation de produit, ledit conteneur (2) ayant son côté inférieur fermé par un piston-chasse (5) et étant muni d'une partie tête (3) comprenant un dispositif de mesure à commande manuelle (8) qui comprend un piston distributeur (22) pouvant se déplacer en coulissant dans une chambre d'aspiration (15) au moyen d'un bouchon d'actionnement (7), ladite chambre d'aspiration (15) étant adaptée pour communiquer de façon sélective avec ledit conteneur (2) et un canal de distribution (12), respectivement, en réponse au déplacement dudit piston distributeur (22), caractérisé en ce que ledit bouchon d'actionnement (7) est muni d'une partie formant tube axial (17) dans laquelle un tube de guidage (23) dudit piston distributeur (22) est reçu en contact d'accouplement à déplacement axial, et un bouchon d'étanchéité (14) définit une cavité de communication (37) communiquant avec une ouverture de passage (13) dudit conteneur (2) et adaptée pour communiquer de façon sélective avec ladite chambre d'aspiration (15) par une ouverture d'alimentation manœuvrable (33), ledit bouchon d'étanchéité (14) formant un passage (34) étanche au produit pour ladite partie tube (17) dudit bouchon d'actionnement (7), ladite ouverture d'alimentation (33) entre ladite chambre d'aspiration (15) et ladite cavité de communication (37) étant adaptée pour être directement commandée par ladite partie tube (17) dudit bouchon d'actionnement (7).

2. Distributeur selon la revendication 1, caractérisé en ce que ledit piston distributeur (22) est formé en un corps annulaire en forme de cuvette ayant une ouverture centrale (24) dans sa partie inférieure, et est fait d'une seule pièce avec ledit tube de guidage (23).

3. Distributeur selon la revendication 1, caractérisé en ce que ledit tube de guidage (23) est muni d'une projection annulaire (25) reçue dans une première cavité cylindrique (27) à l'intérieur de ladite partie tube (17) dudit bouchon d'actionnement (7), la longueur axiale de ladite cavité cylindrique (27) étant supérieure, de préférence deux fois plus grande que la longueur axiale de ladite projection annulaire (25) dudit tube de guidage (23).

4. Distributeur selon la revendication 1, caractérisé en ce que l'extrémité supérieure dudit tube de guidage (23) orientée en sens opposé audit piston distributeur (22) est munie d'un clapet de soupape (28) faisant partie intégrante de celle-ci, relié de façon articulée au bord de préférence oblique dudit tube de guidage (23) et adapté dans une position fermée pour être en contact de support avec une surface d'appui annulaire (31) d'une seconde cavité cylindrique (30) de la partie tube (17) dudit bouchon d'actionnement (7).

5. Distributeur selon la revendication 1, caractérisé en ce que ladite ouverture d'alimentation est formée en une fente (33) dans la paroi dudit tube de guidage (23) dans la partie terminale de celui-ci qui est orientée vers le piston distributeur, ladite fente étant adaptée pour être ouverte et fermée, respectivement, par une partie terminale de la partie tube

(17) dudit bouchon d'actionnement (7) orientée vers ledit piston.

6. Distributeur selon la revendication 1, caractérisé en ce que ledit passage (34) dudit bouchon d'étanchéité (14) est muni d'un joint à deux lèvres servant de surface d'appui coulissante à ladite partie tube (17) dudit bouchon d'actionnement (7).

7. Distributeur selon la revendication 1, caractérisé en ce que ladite partie tube (17) dudit bouchon d'actionnement (7) coopère avec ladite ouverture centrale (24) dudit piston distributeur (22) et dudit tube de guidage (23) pour former ledit canal de distribution (19), ledit canal de distribution étant disposé selon un angle orienté vers l'extérieur dans une partie inférieure dudit bouchon d'actionnement (7).

8. Distributeur selon la revendication 7, caractérisé en qu'un élément de fermeture séparé (20) muni d'un élément de prise (21) faisant partie intégrante de celui-ci est inséré dans une ouverture de sortie dudit canal de distribution (19).

9. Distributeur selon la revendication 1, caractérisé en ce qu'une surface supérieure dudit bouchon d'étanchéité (14) forme une surface d'appui pour un ressort de rappel (36) ayant son extrémité opposée en contact avec une partie inférieure dudit bouchon d'actionnement (7) et entourant de façon coaxiale ladite partie tube (17).

10. Distributeur selon la revendication 1, caractérisé en ce que la partie terminale supérieure dudit conteneur (2) est sensiblement fermée par une paroi terminale supérieure (10) procurant au moins une ouverture de passage (13) et formée de façon intégrante avec une section de guidage extérieure (6) servant de surface d'appui coulissante audit bouchon d'actionnement (7), et par ordre disposé radialement vers l'intérieur, avec une première projection annulaire (11) et une seconde projection annulaire (12).

11. Distributeur selon la revendication 10, caractérisé en ce que lesdites première et seconde projections annulaires (11, 12) définissent des ouvertures annulaires tenant lieu desdites ouvertures de passage (13) dans ladite paroi terminale (10) dudit conteneur.

12. Distributeur selon la revendication 10, caractérisé en ce que la seconde projection annulaire radialement intérieure (12) forme ladite chambre d'aspiration (15).

13. Distributeur selon la revendication 10, caractérisé en ce que ladite première projection annulaire (11) forme une surface de montage pour ledit bouchon d'étanchéité (14).

14. Distributeur selon la revendication 1, caractérisé en ce que ladite partie tube (17), ledit piston distributeur (22), ladite chambre d'aspiration (15) et ledit bouchon d'étanchéité (14) sont disposés en alignement symétrique coaxial par rapport à l'axe central longitudinal du distributeur (1).

15. Distributeur selon la revendication 14, caractérisé en ce qu'un contour du fond de ladite chambre d'aspiration (15) correspond au contour opposé en forme de cuvette dudit piston distributeur (22) et est muni d'une goupille centrale (16) dépassant de celui-ci dans la direction dudit piston distributeur.



16. Distributeur selon la revendication 15, caractérisé en ce que ledit piston distributeur (22) ainsi que le fond de ladite chambre d'aspiration (15) sont formés avec des surfaces limites inclinées correspondantes pour réduire une résistance à la circulation. 5
17. Distributeur selon la revendication 1, caractérisé en ce que ledit bouchon d'étanchéité (14) est muni de nervures raidisseuses (35) pour le support dudit passage (34) dans un rebord supérieur de ladite seconde projection annulaire (12) qui forme ladite chambre d'aspiration (15). 10
18. Distributeur selon la revendication 1, caractérisé en ce que ledit conteneur (2) est formé en un corps cylindrique adapté pour avoir un couvercle de fermeture (4) recouvrant ledit bouchon d'actionnement (7) qui est vissé dessus. 15
19. Distributeur selon la revendication 1, caractérisé en ce que ledit bouchon d'actionnement (7) est guidé en pouvant se déplacer et se verrouiller sur une surface intérieure de ladite section de guidage (6), et ledit couvercle de fermeture (4) est retenu sur la surface extérieure de ladite section de guidage (6). 20
20. Distributeur selon la revendication 1, caractérisé en ce que ledit piston-chasse a une projection centrale adaptée dans une position terminale supérieure dudit piston-chasse pour être reçue dans une cavité complémentaire formée par le fond de ladite chambre d'aspiration (15). 25 30

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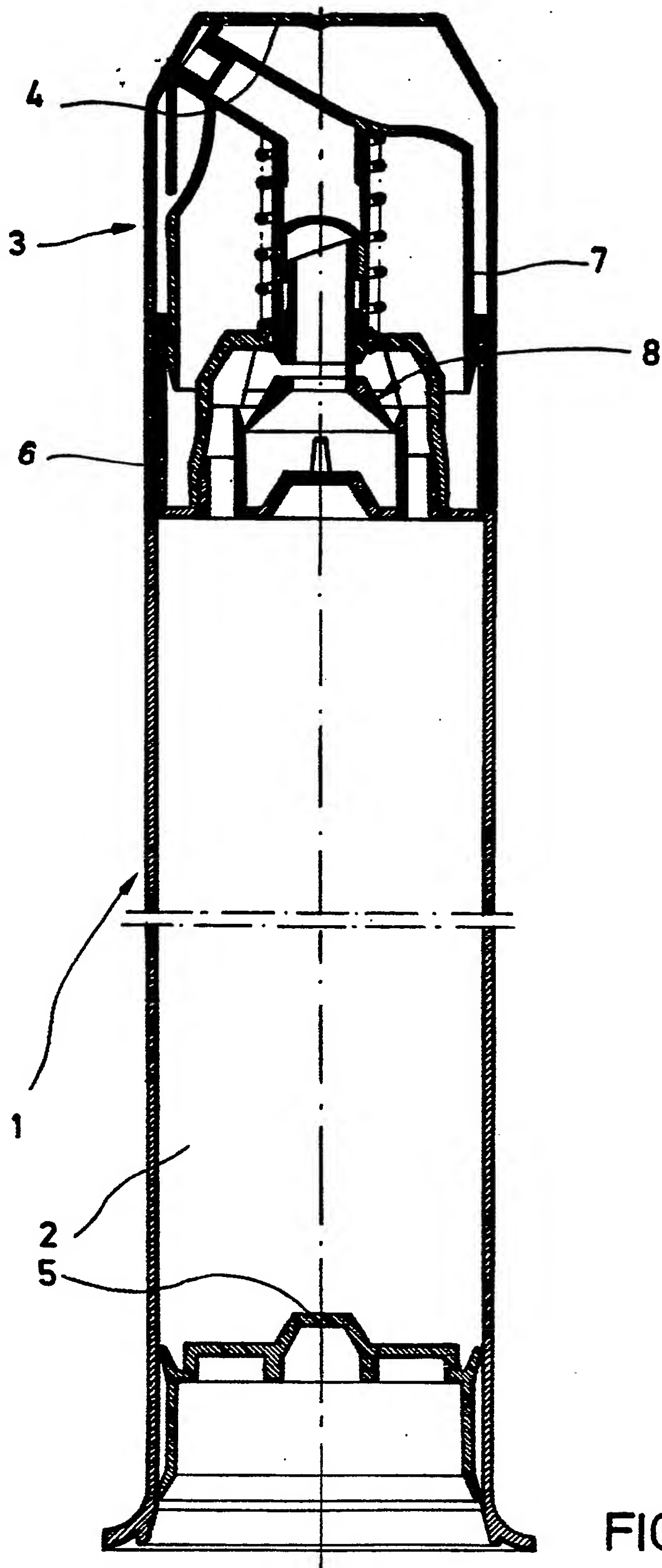


FIG. 1

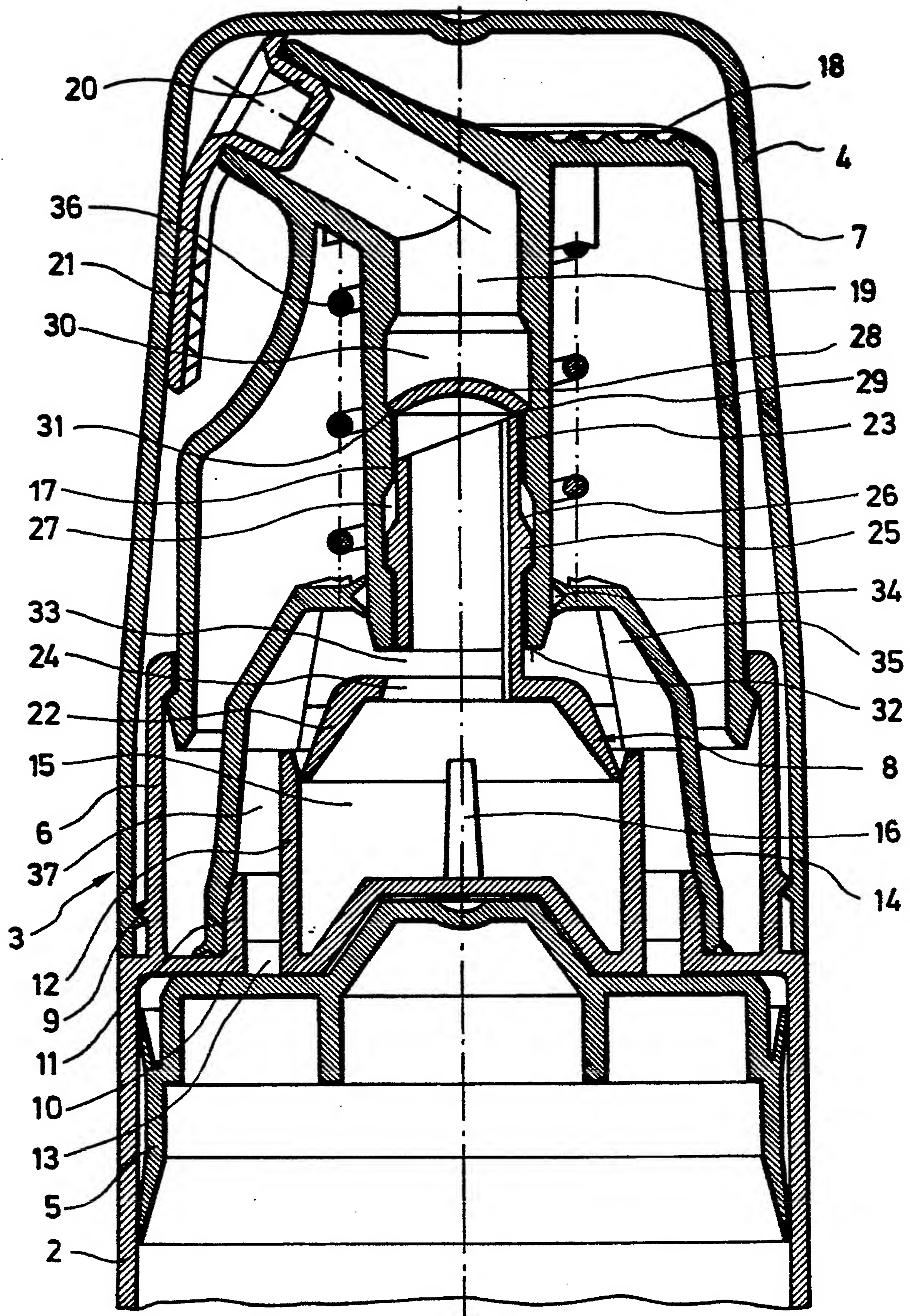


FIG. 2